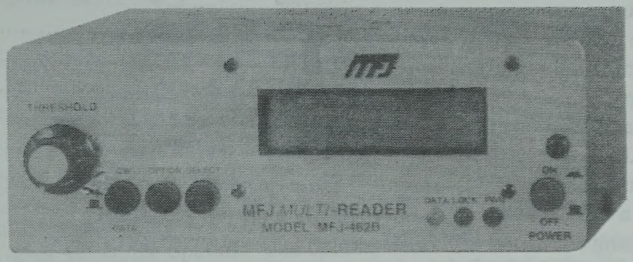
MultiReader™

Model MFJ-462B



INSTRUCTION MANUAL

CAUTION: Read All Instructions Before Operating Equipment

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VERSION 2E

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BASIC OPERATION:

The MFJ-462B *MultiReader*™ is easy to operate. The push-button marked **POWER** controls the power to the unit. After turning the unit ON, the MFJ-462B will light the **PWR** LED and display a scrolling sign-on message across the LCD. On the left side of the unit is a hole for LCD contrast adjustment. When the display shows the SIGNAL SETUP prompt, the MFJ-462B is ready for operation. All the MFJ-462B requires for proper operation is that you select the signal type that you wish to decode, the signal baud rate, along with tuning to the desired signal on your radio. Some signals may require that you select the REVERSE function to properly decode the desired signal. Once you properly tune your radio to the desired signal, the MFJ-462B begins to display the decoded signal information. If characters cannot be decoded, which is the case for some RTTY signals, an underscore character ("_") will be scrolled for each undecoded character. If the unit is not decoding characters correctly, check the format setting to confirm that it is correct.

MENU OPERATION:

The MFJ-462B menu system consists of two front panel push-buttons labeled **OPTION** and **SELECT** along with the LCD display. Pressing the **OPTION** button changes the option being displayed on the LCD. The available OPTIONS within the MFJ-462B operating system are shown below:

1. SIGNAL SETUP
2. BAUD RATE SETUP
3. PRINTER SETUP
4. RAM SETUP
5. REVERSE SETUP
6. PRACTICE KEY

Pressing the **SELECT** button executes the **OPTION** currently displayed on the LCD, and goes to a sub-menu. Under each sub-menu are other selectable options. The options under the sub-menus are the actual mode settings, such as OPERATING MODE, BAUD RATE, PRINTER ON/OFF, RAM PLAYBACK and RAM SCROLLING, just to name a few.

For example, turn the unit ON, and wait a few seconds for the unit's sign-on message to finish. When the MFJ-462B finishes its sign-on message, it displays the first main menu option, SIGNAL SETUP. Pressing the **OPTION** button displays the second main menu option, BAUD RATE SETUP. Pressing the **SELECT** button now causes the MFJ-462B to switch to the BAUD RATE SETUP sub-menu and display the first option, 45 BAUD. Pressing the **SELECT** button now tells the MFJ-462B to select 45 baud as it's decode baud rate, and to return to the main menu option, BAUD RATE SETUP. Pressing the **OPTION** button repeatedly will cause the unit to scroll through the next main menu options, PRINTER SETUP, RAM SETUP, REVERSE SETUP, and PRACTICE KEY and then back to the first main menu option, SIGNAL SETUP. Pressing the **SELECT** button now tells the MFJ-462B to switch to the SIGNAL SETUP sub-menu and display the first option, CW. Press the **OPTION** button to switch the display to RTTY 170 and then press the **SELECT** button. ***The MFJ-462B is now ready to decode 45 baud, 170 shift RTTY.*** Refer to Figure 1 for the MFJ-462B *MultiReader*™ menu layout.

MFJ-462B MultiReader™

SPECIFICATIONS:

Modes:	CW, RTTY, ASCII, AMTOR FEC	NOTE: Reverse mode selectable for RTTY, ASCII, and AMTOR
Shifts:	RTTY: 170 Hz, 425 Hz, 850 Hz ASCII: 170 Hz AMTOR FEC: 170 Hz	
Mark Frequency:	US RTTY 2125 Hz European RTTY 1275 Hz	NOTE: US or European frequency jumper-selected.
Baud Rates:	CW: Approximately 50 WPM m RTTY: 45, 50, 57, 75, 100 ASCII: 110 AMTOR FEC: 100	
Printer:	Must be EPSON or compatible	
MessageSaver™:	8000 characters volatile RAM	
Code Practice:	Straight key CW decoding	

CONNECTIONS:

POWER

A 12 VDC 300 milliamp power supply should be used with the MFJ-462B. The **POWER** jack accepts a 2.1 mm coaxial plug with the center conductor positive and the sleeve negative. An optional DC supply, the MFJ-1312B, is available from MFJ. Connect your MFJ-1312B Power Adapter or compatible DC supply, coaxial line with shield ground, into the **POWER** jack on the rear of the MFJ-462B.

PRINTER PORT

A DB-25 connector is located on the MFJ-462B for use with an EPSON compatible printer. An optional DB-25 to Centronics printer cable, the MFJ-5412, is available from MFJ.

AUDIO INPUT

There are two methods of feeding audio into the MFJ-462B Multi-Reader. The 3.5 mm mono jack, labeled **AUDIO INPUT**, can be used with a cable, using the tip as audio and shield as ground. An optional 3.5mm audio cable, the MFJ-5162, is available from MFJ. The 5-pin DIN jack can be used with a cable using pin 4 as audio and pin 2 as ground. This connection scheme matches popular TNC connections so that you may use ready-made TNC cables.

HAND KEY

A hand key may be used with the MFJ-462B for CW code practice. Connect your hand key to the 3.5mm **HAND KEY** jack on the rear, with the tip to the key and the shield to ground. To listen as you practice your code, place the **SPEAKER SELECT** switch on the rear panel IN to the **HANDKEY** position. For normal operation, this switch should be in the **RADIO** (OUT) position.

JUMPERS

Jumpers **J6**, **J7**, and **J8**, located inside on the right side of the unit, are for setting either the US or European RTTY frequency shifts. The unit comes with pins 2 & 3 of each jumper shorted, for use with the US RTTY shifts. If you require the European RTTY shifts, then short pins 1 & 2 of **J6**, **J7**, and **J8**.

BAUD RATE SETUP

The BAUD RATE SETUP sub-menu allows you to choose the baud rate of the signal that you want the MFJ-462B to decode. ***This only applies to RTTY signals***. The selections in this sub-menu do not affect the CW, ASCII, or AMTOR FEC modes. There are six selections under the BAUD RATE SETUP sub-menu:

1. 45 BAUD
2. 50 BAUD
3. 57 BAUD
4. 75 BAUD
5. 100 BAUD
6. MAIN MENU

Press the **OPTION** button to change the sub-menu options, and press the **SELECT** button to select the baud rate of the signal that you want to decode. The baud rate will be updated and the unit will return to the main menu. To exit this sub-menu without changing the baud rate, press the **OPTION** button until the display reads MAIN MENU, then press the **SELECT** button to exit.

PRINTER SETUP

This sub-menu allows you to enable or disable printing of received text to the EPSON or compatible printer attached to your MFJ-462B. There are two sub-menu selections:

1. PRINTER ON/OFF
2. MAIN MENU

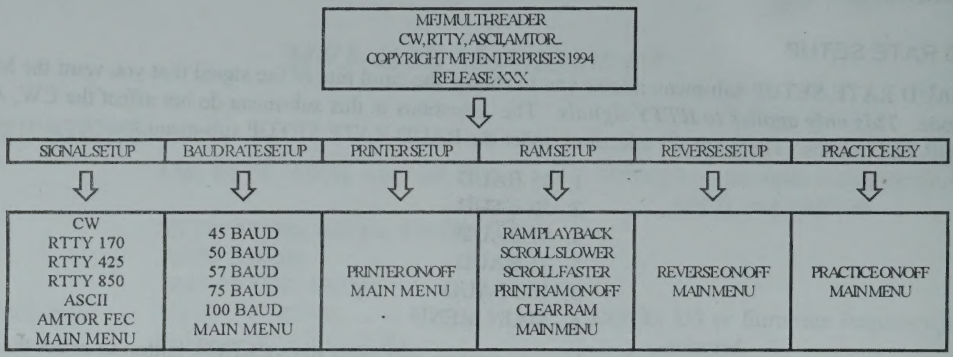
Press the **OPTION** button to change the sub-menu options, and press the **SELECT** button to change the printer enable. If you press **SELECT** in the PRINTER ON/OFF option, the MFJ-462B will toggle the printer enable. It will display the current state for approximately one second then switch to the main menu. If the printer enable is set to ON, then each received character is sent to the printer as soon as it is displayed. The printer will store the characters in a buffer until it has received eighty characters, then the printer will print the buffered characters. The printer will always store and print character in this manner. If the printer has an odd amount of character such as 100, then the printer must be taken OFF LINE for the printer to print the remaining buffered characters. The printer can be taken OFF LINE by pressing its ON LINE button. For further instruction on your printer, please refer to your printer manual. To exit this sub-menu without changing the printer enable, press the **OPTION** button until the display reads MAIN MENU, then press the **SELECT** button to exit.

RAM SETUP

This sub-menu allows you to view received data that was saved to the RAM buffer. There are six sub-menu selections under the RAM SETUP sub-menu:

1. RAM PLAYBACK
2. SCROLL SLOWER
3. SCROLL FASTER
4. PRINT RAM ON/OFF
5. CLEAR RAM
6. MAIN MENU

Press the **SELECT** button while the RAM SETUP prompt is displayed on the LCD to display the first RAM SETUP sub-menu, RAM PLAYBACK. Pressing the **SELECT** button now prompts the MFJ-462B to begin displaying all data received since being turned ON. The stored data will start scrolling from the beginning of the buffer to the last received character. The last received character is followed by an "x" to denote the end of the buffer. The RAM buffer has a storage capacity of only 8000 characters. If more than 8000 characters have been received, only the last 8000 characters will be available for display. The display scroll rate may be modified by pressing the **SELECT** button while in the SCROLL SLOWER or SCROLL FASTER selections. To stop scrolling the view screen, press either the **OPTION** button or the **SELECT** button. Do the same to start the view



MFJ-462B MultiReader™ Menu Layout
Figure 1

MAIN MENU:

The main menu allows you to select the configuration sub-menus, so you can set-up the MFJ-462B to decode the various signals of which it is capable. There are six main menu **OPTIONS**:

1. SIGNAL SETUP
2. BAUD RATE SETUP
3. PRINTER SETUP
4. RAM SETUP
5. REVERSE SETUP
6. PRACTICE KEY

Press the **OPTION** button to change the menu options, then press the **SELECT** button to enable a sub-menu. When the PRACTICE KEY option is displayed and you press the **OPTION** button, the MFJ-462B returns to the beginning of the main menu, SIGNAL SETUP.

SIGNAL SETUP

The SIGNAL SETUP sub-menu allows you to choose the type of signal that you want the MFJ-462B to decode. There are seven sub-menu selections:

1. CW
2. RTTY 170
3. RTTY 425
4. RTTY 850
5. ASCII
6. AMTOR FEC
7. MAIN MENU

Press the **OPTION** button to change the sub-menu options. Once the signal type you want is displayed on the LCD, press the **SELECT** button to begin decoding the type of signal you selected. When you press the **SELECT** button again, the MFJ-462B will exit signal decoding, and return to the SIGNAL SETUP sub-menu. If you are in the RTTY mode, and the MFJ-462B is not decoding the signal, you may have the signal baud rate set improperly. In this case, you can press the **OPTION** button to exit decoding and go to the BAUD RATE SETUP sub-menu. At the BAUD RATE SETUP sub-menu, you may select another baud rate setting, then return to the SIGNAL SETUP sub-menu and re-enter the previous RTTY mode. To exit this sub-menu without selecting a signal type, press the **OPTION** button until the display reads MAIN MENU, then press the **SELECT** button to exit.

BAUD RATE SETUP

The BAUD RATE SETUP sub-menu allows you to choose the baud rate of the signal that you want the MFJ-462B to decode. ***This only applies to RTTY signals***. The selections in this sub-menu do not affect the CW, ASCII, or AMTOR FEC modes. There are six selections under the BAUD RATE SETUP sub-menu:

1. 45 BAUD
2. 50 BAUD
3. 57 BAUD
4. 75 BAUD
5. 100 BAUD
6. MAIN MENU

Press the **OPTION** button to change the sub-menu options, and press the **SELECT** button to select the baud rate of the signal that you want to decode. The baud rate will be updated and the unit will return to the main menu. To exit this sub-menu without changing the baud rate, press the **OPTION** button until the display reads MAIN MENU, then press the **SELECT** button to exit.

PRINTER SETUP

This sub-menu allows you to enable or disable printing of received text to the EPSON or compatible printer attached to your MFJ-462B. There are two sub-menu selections:

1. PRINTER ON/OFF
2. MAIN MENU

Press the **OPTION** button to change the sub-menu options, and press the **SELECT** button to change the printer enable. If you press **SELECT** in the PRINTER ON/OFF option, the MFJ-462B will toggle the printer enable. It will display the current state for approximately one second then switch to the main menu. If the printer enable is set to ON, then each received character is sent to the printer as soon as it is displayed. The printer will store the characters in a buffer until it has received eighty characters, then the printer will print the buffered characters. The printer will always store and print character in this manner. If the printer has an odd amount of character such as 100, then the printer must be taken OFF LINE for the printer to print the remaining buffered characters. The printer can be taken OFF LINE by pressing its ON LINE button. For further instruction on your printer, please refer to your printer manual. To exit this sub-menu without changing the printer enable, press the **OPTION** button until the display reads MAIN MENU, then press the **SELECT** button to exit.

RAM SETUP

This sub-menu allows you to view received data that was saved to the RAM buffer. There are six sub-menu selections under the RAM SETUP sub-menu:

1. RAM PLAYBACK
2. SCROLL SLOWER
3. SCROLL FASTER
4. PRINT RAM ON/OFF
5. CLEAR RAM
6. MAIN MENU

Press the **SELECT** button while the RAM SETUP prompt is displayed on the LCD to display the first RAM SETUP sub-menu, RAM PLAYBACK. Pressing the **SELECT** button now prompts the MFJ-462B to begin displaying all data received since being turned ON. The stored data will start scrolling from the beginning of the buffer to the last received character. The last received character is followed by an "x" to denote the end of the buffer. The RAM buffer has a storage capacity of only 8000 characters. If more than 8000 characters have been received, only the last 8000 characters will be available for display. The display scroll rate may be modified by pressing the **SELECT** button while in the SCROLL SLOWER or SCROLL FASTER selections. To stop scrolling the view screen, press either the **OPTION** button or the **SELECT** button. Do the same to start the view

screen scrolling again. To exit before reaching the end of the buffer, press both the **OPTION** button and the **SELECT** button at the same time.

Pressing **SELECT** while in PRINT RAM ON/OFF sub-menu enables printing of the RAM buffer to an EPSON or compatible printer. The printer must be attached to the DB-25 female connector labeled **PRINTER PORT** on the rear of the MFJ-462B. This feature is only for printing the RAM buffer characters being displayed during RAM PLAYBACK. The PRINT RAM ON/OFF feature is not for "real-time" printing of characters received off-the-air. Pressing the **SELECT** button while in the CLEAR RAM sub-menu erases all characters currently in the RAM buffer. In order to exit this sub-menu without changing the RAM options, press the **OPTION** button until the display reads MAIN MENU, then press the **SELECT** button to exit.

REVERSE SETUP

This sub-menu allows you to enable or disable the REVERSE mode for RTTY, ASCII, AMTOR FEC. There are two sub-menu selections under the REVERSE SETUP sub-menu:

1. REVERSE ON/OFF
2. MAIN MENU

Press the **OPTION** button to change the sub-menu options, then press the **SELECT** button to change modes. If you press **SELECT** in the REVERSE ON/OFF option, the MFJ-462B will toggle the reverse mode. It will display the current state for approximately one second then switch to the main menu. If the reverse mode is set to ON, then the MFJ-462B will invert each bit received. To exit this sub-menu without changing the reverse mode, press the **OPTION** button until the display reads MAIN MENU, then press the **SELECT** button to exit.

PRACTICE KEY

This sub-menu allows you to enable or disable the practice mode for the CW hand key. There are two sub-menu selections under the PRACTICE KEY sub-menu:

1. PRACTICE ON/OFF
2. MAIN MENU

Press the **OPTION** button to change the sub-menu options, then press the **SELECT** button to enable the practice session. If you press **SELECT** in the PRACTICE ON/OFF option, the MFJ-462B will enter the hand key practice mode. All keying performed through the **HAND KEY** jack will be decoded and displayed on the LCD. In addition, the decoded data will be sent to the printer port, as well as recorded in the RAM for future review. To listen to the code, place the **SPEAKER SELECT** switch beside the **HAND KEY** jack IN to the **HAND KEY** position. For normal operation, this switch should be in the **RADIO** (OUT) position. To exit the practice mode, press either the **SELECT** or the **OPTION** button. To exit this sub-menu without entering the practice mode, press the **OPTION** button until the display reads MAIN MENU, then press the **SELECT** button to exit.

PROPER RADIO TUNING:

Proper tuning of your radio is critical to achieve optimum performance in any mode from your MFJ-462B. Also, knowing what type of signal you are tuning in is very important. You do not want to try tuning in an AMTOR FEC signal with the MFJ-462B setup in the RTTY 170 mode ... this just will not work properly. An AMTOR FEC signal sounds just like an RTTY 170 signal when listening to them both on the radio.

In this section we will explain the procedure for proper radio tuning for the different type signals that apply to the MFJ-462B. However, it is still left up to the end user to ensure that the MFJ-462B is setup for the same type of signal that is being tuned in on the radio. So, if we are ready to go, then let's get started.

TUNING IN A CW SIGNAL

First of all, scan the bands for a strong, clean signal. Remember, the signal must be the same type as what the MFJ-462B is setup for, in this case CW. If not, then the MFJ-462B will not decode the signal properly.

There are a couple of different methods to tune in a CW signal on the radio, which are compatible with the MFJ-462B. The first method is to use a **NARROW CW** filter in your radio, if your radio has such a filter. The **filter passband** must be at **700 Hz**, which is the center frequency of the CW demodulator in the MFJ-462B. The second method is to use the **L**ower **S**ide **B**and mode, or **LSB** on the radio. When using the LSB mode on the radio, always start on the "higher side" of the desired signal, then tune the radio so the "pitch" of the signal goes down in frequency.

Using a Narrow CW Filter

For maximum performance while in the CW mode, the DATA/CW switch on the front panel must be IN, to the CW position. Please follow the steps below for tuning in a CW signal, if your radio has a NARROW CW filter:

1. Set the MFJ-462B to the CW operating mode by using the **OPTION** and **SELECT** buttons.

2. Set the **DATA/CW** switch on the front panel to the CW position (the IN position).

3. Set the **THRESHOLD** control on the front panel fully clockwise. This sets up the demodulator for maximum bandwidth.

4. Set the **SPEAKER SELECT** switch on the back panel to the OUT position. This allows the internal speaker of the MFJ-462B to be used to monitor the incoming CW audio signal.

5. Vary the VFO frequency dial on the radio until both the **LOCK** and **DATA** leds are flashing with the incoming CW signal. The LOCK and DATA leds should be bright and flashing together. If either led is dimly lit, but is still flashing with the other, then slightly vary the VFO dial until the dim led becomes brighter, but still flashes together with the other. Once the leds are flashing together with the incoming signal, vary the VFO dial slightly while watching the MFJ-462B display until good CW copy is obtained.

6. Now with the MFJ-462B decoding the incoming CW signal, turn the **THRESHOLD** control counter-clockwise until the LOCK led "loses" the signal.

7. Fine tune the VFO dial on your radio until the LOCK led once again follows the incoming CW signal.

8. Repeat steps 6 and 7 until you have adjusted the **THRESHOLD** control to the absolute minimum setting possible for good CW copy. With the bandwidth now set to the absolute minimum possible, the MFJ-462B will demodulate clean CW signals because the input circuit rejects noise that would otherwise interfere with the decoding of the incoming signal.

Using the LSB Mode

Please follow the steps below for tuning in a CW signal, if you use the LSB mode in your radio:

1. Set the MFJ-462B to the CW operating mode by using the **OPTION** and **SELECT** buttons.

2. Set the **DATA/CW** switch on the front panel to the CW position (IN position).

3. Set the **THRESHOLD** control on the front panel fully clockwise. This sets up the demodulator for maximum bandwidth.

4. Set the **SPEAKER SELECT** switch on the back panel to the OUT position. This allows the internal speaker of the MFJ-462B to be used to monitor the incoming CW audio signal.

5. Starting on the higher side of the CW signal, vary the VFO frequency dial on the radio lower in frequency until both the **LOCK** and **DATA** leds are flashing with the incoming CW signal. The LOCK and DATA leds should be bright and flashing together. If either led is dimly lit, but is still flashing with the other, then slightly vary the VFO dial until the dim led becomes brighter, but still flashes together with the other. Once the leds are flashing together with the incoming signal, vary the VFO dial slightly while watching the MFJ-462B display until good CW copy is obtained.

6. Now with the MFJ-462B decoding the incoming CW signal, turn the THRESHOLD control counter-clockwise until the LOCK led "loses" the signal.

7. Fine tune the VFO dial on your radio until the LOCK led once again follows the incoming CW signal.

8. Repeat steps 6 and 7 until you have adjusted the THRESHOLD control to the absolute minimum setting possible for good CW copy. With the bandwidth now set to the absolute minimum possible, the MFJ-462B will demodulate clean CW signals because the input circuit rejects noise that would otherwise interfere with the decoding of the incoming signal.

This completes this section on Tuning in a CW Signal. Just keep in mind that there are a couple of things that you must do to allow sucessful decoding of CW signals:

1. Make sure that the MFJ-462B is setup in the CW mode.
2. Be sure to use the THRESHOLD control to help reject any noise that would interfere with decoding the incoming signal.

TUNING IN RTTY/ASCII/AMTOR FEC SIGNALS

First of all, set the **DATA/CW** switch on the front panel OUT, to the **DATA** position. The MFJ-462B is calibrated for optimum RTTY performance with a MARK tone of 2125 Hz and a SPACE tone of either 2295, 2550, 2975 Hz for shifts of 170, 425, and 850 Hz, respectively. Optimum ASCII/AMTOR FEC performance occurs with a MARK tone of 2125 Hz and a SPACE tone of 2295 Hz for a 170 Hz shift. Vary the frequency dial on your radio until the **LOCK** LED is lit constantly. While keeping the **LOCK** LED lit, vary the frequency until the **DATA** LED blinks with the audio tone shifts of the received signal. If the data is garbled, try changing baud rates or REVERSE mode, or even the SIGNAL SETUP operating mode. This is because RTTY and AMTOR FEC signals sound alike, and you may be trying to decode RTTY, with the MFJ-462B set to the AMTOR FEC mode, or vice versa.

CW ABBREVIATIONS:

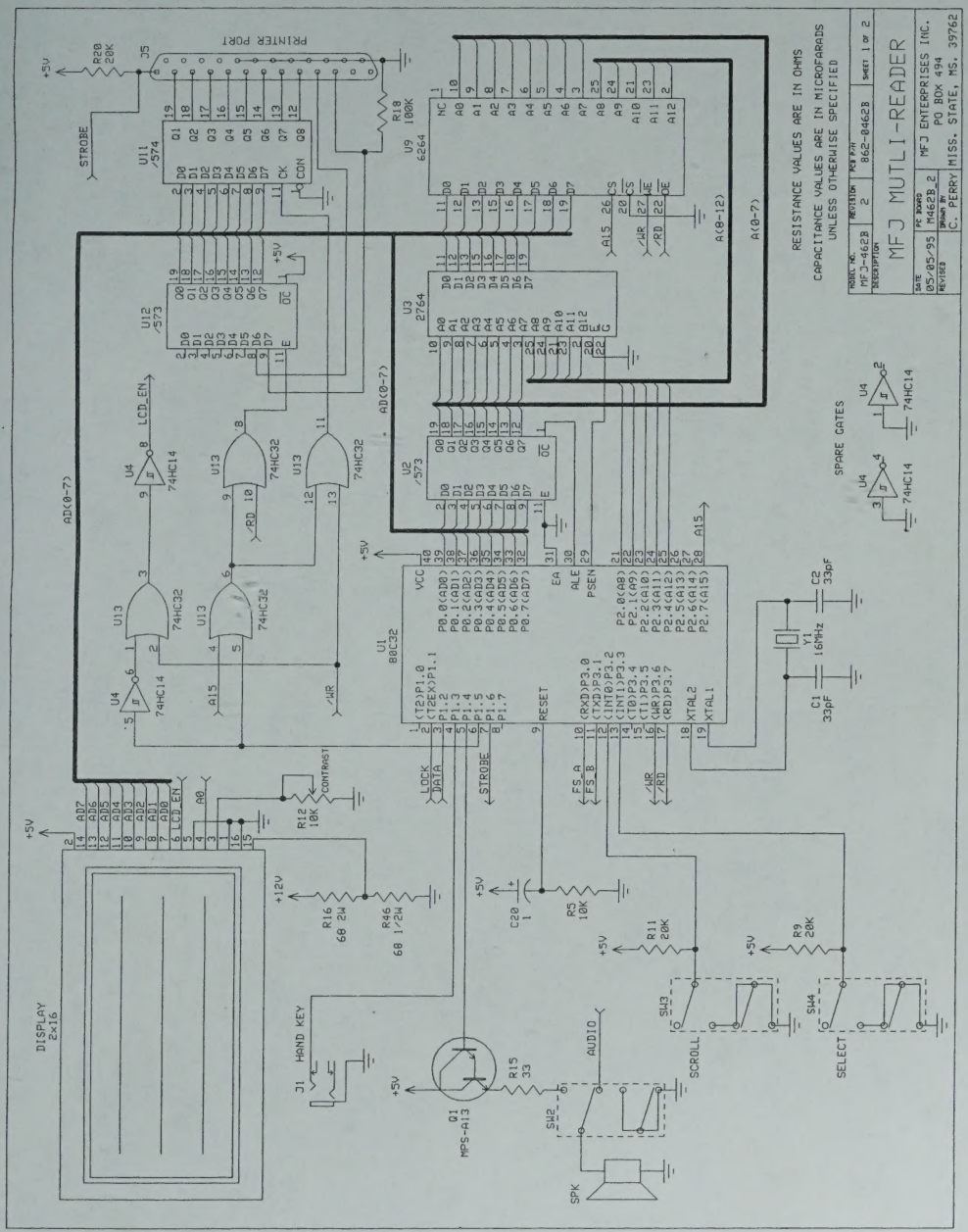
73	best regards	MSG	message
88	love and kisses	NR	number
ABT	about	NW	now
AGN	again	OM	old man
ANT	antenna	OP	operator
BK	break	R	are, received, roger
CPY	copy	RCVR	receiver
CQ	general call to any station	RIG	equipment
CUL	see you later	RST	readability, strength, tone report
CU	see you	SIGS	signal
DE	from	STN	station
DX	distance, rare station	TEMP	temperature
ES	and	TKS	thanks
FB	fine business	TNX	thanks
FER	for	UR	you are
FREQ	frequency	U	you
GA	good afternoon, go ahead	WL	well
GE	good evening	WT	watt
GM	good morning	WX	weather
HR	here	XCVR	transceiver
HW	how	XMTR	transmitter
K	go ahead	XYL	wife

TECHNICAL ASSISTANCE:

If you have any problem with this unit first check the appropriate section of this manual. If the manual does not reference your problem or your problem is not solved by reading the manual, you may call *MFJ Technical Service* at **601-323-0549** or the *MFJ Factory* at **601-323-5869**. You will be best helped if you have your unit, manual and all information on your station handy so you can answer any questions the technicians may ask.

You can also send questions by mail to MFJ Enterprises, Inc., 300 Industrial Park Road, Starkville, MS 39759; by Facsimile (FAX) to 601-323-6551; or by email to techinfo@mfjenterprises.com. Send a complete description of your problem, an explanation of exactly how you are using your unit, and a complete description of your station.

MFJ-462B SCHEMATIC DIAGRAM:



MFJ-462B SCHEMATIC DIAGRAM: